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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DURNFORD GESZVAIN, DILLON	

ART UNIT	PAPER NUMBER
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/712,770	NAGAYOSHI ET AL.	
	Examiner	Art Unit	
	Dillon Durnford-Geszvain	2622	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-16,18-24,29-32,36 and 39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-16,29-32 and 36* is/are rejected.

7)☒ Claim(s) *18-24 and 39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims **3-16, 18-24, 29-32, 36** and **39** are pending, claims **18-24** have been amended, claim **39** is newly added, and claims **1, 2, 17, 25-28, 33-35, 37** and **38** are cancelled.

Response to Arguments

2. Applicant's arguments filed 10/14/2008 have been fully considered but they are not persuasive.

The Applicant argues that Ikeda cannot be combined with Iizuki because they teach different ways of mixing pixels. Iizuki teaches combining signal charges from pixels different columns in the horizontal transfer part, and Ikeda teaches combining signal charges from pixels in the same column. The Applicant argues that this difference makes the combination of the references improper because it's not possible to incorporate the method used by Ikeda in the imager used by Iizuki.

The Examiner respectfully disagrees with Applicant's arguments. The Examiner relied on Ikeda to teach that a pixel mixture group can contain signal charges from three pixels. Therefore, the manner in which Ikeda combines the pixels is irrelevant. Ikeda was relied upon to suggest that combining of Iizuki could be extended to groups of 2n+1 pixels. Therefore, the rejection will be maintained.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claims 3-12, 14-16, 29-32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,686,960 (Iizuka) in view of US 6,423,959 (Ikeda et al.).**

As to claim **3**, Iizuka teaches a solid-state image sensing device1 (see Fig. 4), comprising:

vertical transfer parts 4 provided corresponding to respective columns of bidimensionally arranged pixels 2 to vertically transfer signal charges read out from the pixels; and

a horizontal transfer part 7 for horizontally transferring the signal charges received from the vertical transfer parts,

wherein the vertical transfer parts include transfer stages, those located closest to the horizontal transfer part being vertical last stages (the part of 4 over the transfer gates 6 is the vertical last stages, see Column 8 lines 34-38), and the vertical last stages have transfer electrodes formed to have identical configurations repeated every m (m denotes an integer of 2 or higher) columns (see Figs. 8 and 9), and

vertical last stages of columns other than one of the m columns or all vertical last stages of the m columns each are provided with a transfer electrode that is independent of those of other vertical last stages of the m columns so that an operation of transferring signal charges from the vertical last stages concerned to the horizontal transfer part is controlled independently of said other vertical last stages (Column 8 lines 24-46),

the integer m is 2n+1 (n denotes an integer of 1 or higher) (see Figs. 8 and 9 and note that m is 3),

wherein signal charges of pixels included in each of first and second pixel mixture groups are added together in the horizontal transfer part (se Fig. 6 and Column 9 lines 12-16),

where the first pixel mixture groups each are composed of two pixels arranged at every other pixel in a horizontal direction of the bidimensionally arranged pixels (G11 and G13 of Fig. 6), and

the second pixel mixture groups each are composed of 2 pixels that are arranged at every other pixel and are pixels other than those of the first pixel mixture groups in the horizontal direction of the bidimensionally arranged pixels

(R14 and R16 of Fig. 6), with centers of gravity of the pixels of the respective second pixel mixture groups each being located at an equal distance from centers of gravity of the pixels of two first pixel mixture groups adjacent thereto (see Fig. 6 and note that this is just a sample of the imager and it goes on to include columns 7 and higher).

Iizuka further teaches that more than three odd numbered pixels may be added (Column 6 line 67 to Column 7 line 1 or Column 21 lines 14-17, for example).

What Iizuka does not explicitly teach is that the first and second pixel mixture groups contain specifically 2n + 1 pixels, where n is an integer greater than or equal to one. However, Ikeda et al. teaches adding pixels together with groups consisting of 2n + 1 pixels (see Fig. 16). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have enlarged the blocks of Iizuka so that they would include 2n + 1 pixels, such as is done by Ikeda et al. as this would allow for a higher frame rate than what Iizuka which would facilitate high speed capture (see Column 16 lines 19-22 of Ikeda).

Note that in this combination the blocks depicted in Fig. 6 of Iizuka would simply be extended to 5 pixels instead of 3.

As to claim **4**, see the rejection of claim **3** and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim **3**, wherein with respect to each of the first and second pixel mixture groups

present in the vertical last stages,

(a1) only signal charges of pixels located furthest from an output side of the horizontal transfer part in the respective pixel mixture groups each composed of the 2n+1 pixels are transferred from the vertical last stages to the horizontal transfer part (see Fig. 14B of Iizuka, for example),

(a2) the signal charges present in the horizontal transfer part are transferred in a forward direction by a distance corresponding to two pixels (see Fig. 14C of Iizuka),

(a3) only signal charges of pixels that have signal charges remaining in the vertical last stages and are located furthest from the output side of the horizontal transfer part in the respective pixel mixture groups each composed of the 2n+1 pixels are transferred from the vertical last stages to the horizontal transfer part (see Fig. 14D of Iizuka), and

(a4) transfer operations a2 and a3 are repeated until all signal charges of the pixel mixture groups each composed of 2n+1 pixels are transferred from the vertical last stages to the horizontal transfer part (see Fig. 14D).

As to claim **5**, see the rejection of claim **4** and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim **4**, wherein further

(b1) as the last operation of transfer operations a1 to a4, signal charges present in the vertical transfer parts of all the columns are transferred to respective next stages after or at the same time a signal charge of the last pixel

included in each of the pixel mixture groups each composed of 2n+1 pixels is transferred from the vertical last stage to the horizontal transfer part (see Fig. 15F of Iizuka),

(b2) with respect to signal charges transferred to the vertical last stages by transfer operation b1, the transfer operations a1 to a4 are carried out (see Figs. 15G and 15H), and

(b3) transfer operations b1 and b2 are repeated until signal charges included in 2n+1 stages are transferred to the horizontal transfer part (see Fig 15H).

As to claim **6**, see the rejection of claim **3** and note that Iizuka further teaches the solid-state image sensing device according to claim **3**, wherein the vertical last stages located closest to the horizontal transfer part of the vertical transfer parts have transfer electrodes formed to have identical configurations repeated every three columns, and

vertical last stages of at least the second and third columns of the three columns, counted as from an output side of the horizontal transfer part, each are provided with a transfer electrode that is independent of those of the other vertical last stages so that an operation of transferring signal charges from the respective vertical last stages concerned to the horizontal transfer part is controlled independently of the other vertical last stages (see Figs. 8 and 9).

As to claim **7**, see the rejection of claim **6** and note that Iizuka et al. further

teaches the solid-state image sensing device according to claim **6**, wherein a vertical last stage of the first column counted as from the output side of the horizontal transfer part has an electrode configuration that is identical to those of stages other than the vertical last stage of the first column (see Figs. 8 and 9).

As to claim **8**, see the rejection of claim **6** and note that claim **8** corresponds to claim **3** but specifies that n = 1. Therefore, claim **8** is rejected on the same grounds as claim **3** but with n = 1.

Claim **9** depends from claim **6** and roughly corresponds to claim **4** with n = 1 and therefore, claim **9** is rejected on the same grounds as claim **4** but with n = 1.

Claim **10** depends from claim **9** and roughly corresponds to claim **5** with n = 1 and therefore, claim **10** is rejected on the same grounds as claim **5** but with n = 1.

As to claim **11**, see the rejection of claim **3** and note that Iizuka teaches reading out a 3X3 box and adding the pixels (see Fig. 16). Note that if Iizuka were combined with Ikeda et al. as in claim **3** this would be a 5X5 box and 9 pixels would be read out.

As to claim **12**, see the rejection of claim **11** and note that Iizuka in view of

Ikeda et al. would further teach the solid-state image sensing device according to claim **11**, wherein the one pixel mixture group is composed of nine pixels arranged in three rows located at every other row in the vertical direction, with three pixels arranged at every other pixel in the horizontal direction being included in each of the three rows (see Fig. 16 of Iizuka and note that it would contain 9 pixels if extrapolated to a 5X5 box as discussed in claim **11**).

As to claim **14**, see the rejection of claim **3** and note that Iizuka in view of Ikeda et al. would further teach the solid-state image sensing device according to claim **3**, wherein one pixel mixture group is composed of three pixels arranged at every other pixel in the horizontal direction in each of rows located at every three rows in the vertical direction (note that the pixel groups are already taught as containing three pixels arranged at every other pixel and there are pixel mixing groups located every third row in a 5X5 box).

As claim **15**, see the rejection of claim **3** and note that Iizuka further teaches the solid-state image sensing device according to claim **3**, wherein the bidimensionally arranged pixels are provided with color filters arranged so that four pixels of (two pixels arranged horizontally).times.(two pixels arranged vertically) form one unit (see Fig. 4).

As to claim **16**, see the rejection of claim **15** and note that Iizuka further teaches the solid-state image sensing device according to claim **15**, wherein the

color filters are arranged so that a first color filter (green) is provided for two pixels, of the four pixels, located on one diagonal line, and second and third color filters (blue and red) are provided for the other two pixels, respectively (see Fig. 4).

As to claim **29**, Iizuka teaches a solid-state image sensing device1 (see Fig. 4), comprising:

vertical transfer parts 4 provided corresponding to respective columns of bidimensionally arranged pixels 2 to vertically transfer signal charges read out from the pixels; and

a horizontal transfer part 7 for horizontally transferring the signal charges received from the vertical transfer parts,

wherein the vertical transfer parts include transfer stages, those located closest to the horizontal transfer part being vertical last stages (the part of 4 over the transfer gates 6 is the vertical last stages, see Column 8 lines 34-38), and the vertical last stages have transfer electrodes formed to have identical configurations repeated every m (m denotes an integer of 2 or higher) columns (see Figs. 8 and 9), and

vertical last stages of columns other than one of the m columns or all vertical last stages of the m columns each are provided with a transfer electrode that is independent of those of other vertical last stages of the m columns so that an operation of transferring signal charges from the vertical last stages concerned to the horizontal transfer part is controlled independently of said other

vertical last stages (Column 8 lines 24-46).

Iizuka further teaches that more than three odd numbered pixels may be added (Column 6 line 67 to Column 7 line 1 or Column 21 lines 14-17, for example), it does not teach that the mode can be switched between the number of pixels to be added.

However, Ikeda teaches three different modes for reading out in movie mode (see Figs. 12-14) where 2, 3 or 4 pixels are mixed. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added at least modes such as those taught by Ikeda et al. to the invention of Iizuka as this would allow for the quantity of light to be effectively increased for performing previewing (Column 15 lines 66-67 of Ikeda et al.).

As to claim **30**, see the rejection of claim **29** and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim **29**, further comprising color filters of three colors (red green and blue) arranged in a repeated pattern in which among the color filters, those of two out of the three colors are arranged vertically and those of two out of the three colors are arranged horizontally (see Fig. 4 of Iizuka), wherein the operation mode can be switched selectively between at least two modes including a mode of mixing m_1 pixels arranged horizontally and a mode of mixing m_2 pixels arranged horizontally, with the m_1 pixels and m_2 pixels being provided with filters having one of the three colors of the color filters, respectively (see Column 6 line 67 to Column 7 line 1 or Column 21 lines 14-17, for example).

As to claim **31**, see the rejection of claim **29** and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim **29**, further comprising color filters of three colors (red green and blue) arranged in a repeated pattern in which among the color filters, those of two out of the three colors are arranged vertically and those of two out of the three colors are arranged horizontally (see Fig. 4 of Iizuka), wherein the operation mode can be switched selectively between at least two modes selected from a mode of mixing two pixels arranged horizontally, a mode of mixing three pixels arranged horizontally, and a mode of mixing four pixels arranged horizontally, with the two, three, and four pixels being provided with filters having one of the three colors of the color filters, respectively (see the rejection of claim **29** and note that the mixing as is done in Iizuka is done horizontally and thus when combined with Ikeda et al. the mixing of 2, 3 or 4 pixels would be done horizontally).

As to claim **32**, see the rejection of claim **29** and note that Iizuka teaches a mode of mixing no pixels (Column 8 lines 24-26).

As to independent claim **36**, see the rejection of claim **3** and note that Iizuka in view of Ikeda further teaches a camera, comprising a solid-state image sensing device according to claim **3** (see Fig. 23 of Ikeda).

6. **Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,686,960 (Iizuka) in view of US 6,423,959 (Ikeda et al.) further in view of US 7,199,826 (Uya).**

As to claim **13**, see the rejection of claim **3** and note that what neither Iizuka nor Ikeda et al. teach I mixing six pixels in two rows, where three rows are skippedbetween the two read rows. However, Iizuka in view of Ikeda et al. teaches reading three pixels in a row. Further, Uya teaches a method of mixing pixels where three rows are skipped in-between read rows. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have mixed two of the rows of Iizuka in view of Ikeda et al. resulting in the mixing of six pixels and to have separated the read-out rows by three rows as this would result in an image with six times the sensitivity of an ordinary image that can be read out faster than an ordinary image (see, for example, Column 15 lines 63-67 of Ikeda et al.).

Allowable Subject Matter

7. Claims **18-24** and **39** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: as to claims **18-24**, see the Office Action mailed 6/27/2007.

9. Claim **39** is objected to as allowable for reasons similar to claim **18**.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon Durnford-Geszvain whose telephone number is (571)272-2829. The examiner can normally be reached on Monday through Friday 8 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dillon Durnford-Geszvain 2/2/2009

/David L. Ometz/
Supervisory Patent Examiner, Art Unit 2622